

REMARKS

By the present Amendment, claims 1-7 are cancelled and claims 8-14 are added. This leaves claims 8-14 pending in the application, with claim 8 being independent.

Substitute Specification

The specification is revised to eliminate grammatical and idiomatic errors in the originally presented specification. The number and nature of the changes made in the specification would render it difficult to consider the case and to arrange the papers for printing or copying. Thus, the substitute specification will facilitate processing of the application. The substitute specification includes no "new matter". Pursuant to M.P.E.P. § 608.01(q), voluntarily filed, substitute specifications under these circumstances should normally be accepted. A marked-up copy of the original specification is appended hereto.

Rejections Under 35 U.S.C. § 112, Second Paragraph

Claim 2 stands rejected under 35 U.S.C. § 112, second paragraph, on the ground that it is unclear how the dramatic reduction in the cross-section acts as a particle filter. Such recitation, now appearing in claim 9, would be understood by those skilled in this art as being a sufficiently small opening in the device that would prevent the passage of certain particulate matter through the pressure equalization channel. Such prevention of passage of particulate matter provides the particle filter function as disclosed in this application and recited in claim 9.

Thus, claim 9 is believed to be definite and complies with the requirements of 35 U.S.C. § 112.

Rejection Under 35 U.S.C. § 103

Claim 8 covers an accumulator comprising an accumulator housing 1 and a piston 3 movable in the housing along the housing longitudinal axis 4. The housing includes a gas side 5 and a fluid side 7, and has a side wall. The piston separates the gas side and the fluid, and has an annular groove 31 on its periphery and a reduced outside diameter section extending from the annular groove at an end of the piston adjacent the fluid side. First and second guide elements 9 and 17 on the piston periphery interact with the housing side wall, and are located adjacent the gas side and the fluid side, respectively. The second guide element is a guide belt with a dirt stripper lip extending at least approximately to an end of the piston and with a plain compression ring sitting in the annular groove. The dirt stripper lip lengthens a radially outside surface of the guide belt on one its axial ends in an axial direction, tapers toward its free end at a 10° angle relative to the longitudinal axis and extends over the reduced diameter section. The compression ring is rectangular in transverse cross-section. The dirt stripper lip has a root adjacent the compression ring with a thickness less than one-half the radial thickness of said compression ring. At least one sealing element 11 or 15 is offset in an axial direction on the periphery of the piston from the gas side, and is spaced from and between the guide elements. A pressure equalization channel 19 opens on the periphery of the piston between second guide element 17 and sealing element 11 or 15, opens on an axial end 13 of the piston on fluid side 7, and provides fluid communication between those two locations. A device 25 is located in the equalization channel to reduce this cross-sectional area.

By forming the hydraulic accumulator in this manner, long-term operating behavior is enhanced in a simple and effective manner. Particularly, the specially structured dirt stripper lip

with a 10° angle extending from a rectangular compression ring and with the dirt stripper lip having a root adjacent the compression ring with a thickness less than one-half the radial thickness of the compression ring provides a particularly effective structure for preventing dirt from becoming entrapped between the piston and the housing wall.

Original claims 1-7 stand rejected under 35 U.S.C. § 103 as being unpatentable over DE 14 50 347 to Rothe in view of DE 36 38 640 to Larsson. The Rothe patent is cited for a hydraulic accumulator having a piston 1, 2 axially movable in its housing and separating gas side 10 from fluid side 16. The piston periphery allegedly has guide elements 5, 6 interacting with the accumulator housing, with guide 5 also acting as a sealing element. An alleged pressure equalization channel 12 between sealing element 5 and guide element 6 is stated to discharge on the periphery of the piston. Within the piston, a fluid path allegedly extends to the fluid side. A device 13 that reduces a passage cross section is allegedly provided within the pressure equalization channel. A ball valve is allegedly provided upstream of device 13 and allegedly functions as a choke device. It is contended that the device 13 could also function as a nozzle or a porous filter element. The Larsson patent is cited, in Fig. 1, as disclosing a hydraulic accumulator piston 2 including a guide element adjacent the fluid side and formed as a guide belt having a dirt stripper lip extending approximately to the end of the piston. The Larsson guide allegedly has compression ring which sits in an annular groove of the piston periphery with a dirt stripper lip which lengthens its radially outward annular surface on one side in the axial direction and tapers towards its edge. The Larsson piston peripheral area allegedly extends from the fluid side and to the annular groove, and has a section of reduced diameter over which the stripper lip

extends. In support of the rejection, it is alleged that it would be obvious to provide the Larsson dirt stripper lip on the Rothe piston.

Claim 8 is patentably distinguishable over the cited patents by the specific structure of the dirt stripper lip, particularly the 10° angle of tapering, the rectangular cross-section of the compression ring, and the relative thicknesses of the dirt stripper lip root and the radial thickness of the compression ring. Such limitations are not disclosed or rendered obvious by any of the cited patents. Moreover, neither patent discloses the use of a sealing ring between two guide elements, particularly within the overall claim combination.

In applying the Rothe patent to the claimed invention, the Rothe elements 5 and 6 are interpreted as being both guide elements and seal elements. However, as presently recited, the claims require that the sealing element is spaced from and between the guide elements, and thus, constitutes a separate feature. Clearly, such arrangement is not disclosed or rendered obvious by the Rothe patent and/or the Larsson patent.

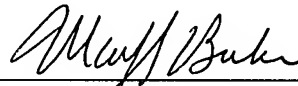
Relative to the claimed dirt stripper lip, only the Larsson patent appears to be cited. However, the Larsson strip is not tapered at a 10° angle, as claimed, does not appear to have a rectangular compression ring in transverse cross-section, and the lip has a root thickness substantially greater than one-half the radial thickness of its ring. Since the noted dirt stripper lip features are not disclosed or rendered obvious by the Larsson patent and are admittedly absent from the Rothe patent, the combination of these two patents does not provide a *prima facie* case of obviousness relative to the subject matter of claim 8.

Accordingly, claim 8 is patentably distinguishable over the Rothe and Larsson patents. None of the other cited patents cure these deficiencies in the Rothe and Larsson patents.

Claims 9-14, being dependent upon claim 8, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents. Specifically, the device acting as a particle filter of claim 9, the choke of claim 10, the nozzle of claim 11, the location and insertion of the nozzle of claim 12, the porous filter element of claim 13 and the integral formation of the compression ring and dirt stripper lip of elastic material of claim 14 are not anticipated or rendered obvious, particularly within the overall claimed combinations.

In view of the foregoing, claims 8-14 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,



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